QUANTITATIVE ASSESSMENT OF PHYSICAL FITNESS AND PSYCHOLOGICAL TRAITS OF WOMEN FOOTBALL PLAYERS BELONGING TO DIFFERENT SOCIO-ECONOMIC STATUS

Doctor of Philosophy (Ph.D.) in Physical Education

BY

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CERTIFICATE

I hereby declare that the short synopsis **"Quantitative Assessment of Physical Fitness and Psychological traits of Women Football Players belonging to different Socio-Economic Status"** being submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in Physical Education under the Department of Physical Education Pedagogy of Lakshmibai National Institute of Physical Education, Gwalior, during the academic year 2023-24.

It is a bonafide record of original work carried out under the supervision of Dr. Anindita Das and has not been submitted in full or in part to any other university or institute for a degree or diploma. Further, it is certified that the short synopsis is plagiarism-free, and proof has been submitted.

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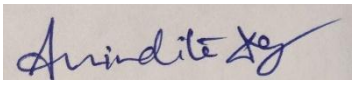

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Abstract

The present study aims to conduct a quantitative assessment of physical fitness and psychological traits among women football players from different socio-economic status in India, focusing on the Eastern and Northeastern regions. Football, as a global sport, transcends cultural and economic barriers, yet access to training resources and competitive opportunities remains uneven, especially in women's sports. In India, socio-economic status (SES) significantly influences athletic development due to disparities in access to coaching, facilities, nutrition, and healthcare. This study investigates how SES and regional factors affect critical performance indicators such as speed, agility, strength, endurance, and psychological traits including mental toughness, mental skills, and coping mechanisms. Four hundred female football players (200 from each region) will be assessed using stratified random sampling and categorized into five SES classes based on the Kuppuswamy Scale (2023). Physical fitness will be evaluated using standardized field tests, while psychological traits will be measured using the Sports Mental Toughness Questionnaire (SMTQ), Mental Skills Questionnaire, and ACSI-28. Descriptive statistics and Two-Way ANOVA will determine the effects of SES and region, and their interaction, on physical and psychological performance traits. The study seeks to highlight disparities and inform policy for more equitable development pathways in Indian women's football, emphasizing the importance of inclusive sports infrastructure and psychosocial support for athletes from diverse backgrounds.

Keywords

Women’s Football, Socio-Economic Status (SES), Physical Fitness, Psychological Traits, Mental toughness, Sports Equity

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1. INTRODUCTION

Football, globally known as soccer, transcends cultural, geographic, and socio-economic boundaries as the world's most popular sport. Its simple rules and minimal equipment requirements have fostered universal appeal beyond recreation, creating a significant socio-economic force (J. Williams, 2013). While men's football has historically dominated, women's football is experiencing a remarkable transformation and growing recognition (Pfister, 2015).

Women's football development reflects a journey of resilience against systemic barriers. Beginning in the early 20th century during World War I, women formed informal teams as they filled roles vacated by men. Despite initial momentum, societal gender norms severely restricted growth until the latter 20th century, when organized leagues and international competitions like the FIFA Women's World Cup emerged. These developments elevated women's football, creating platforms for female athletes to become global role models (J. Williams, 2007). Both FIFA and UEFA now invest substantially in grassroots initiatives, infrastructure, and elite competitions for women's football.

Socio-economic status (SES) remains a critical factor influencing access and development opportunities for female players. Higher-SES athletes typically have access to better training facilities, coaching, nutrition, and healthcare, all crucial for athletic development (Scraton et al., 1999). In India, researchers use standardized socioeconomic assessment tools to understand how socioeconomic factors influence athletes' opportunities and performance.

Beyond physical resources, psychological traits prove essential in competitive environments. Motivation, resilience, focus, and emotional regulation significantly impact performance under pressure (Thelwell et al., 2010). Assessment tools like the Sports Mental Toughness Questionnaire (SMTQ) evaluate these crucial psychological attributes (Sheard et al., 2009). Similarly, physical fitness components like speed, strength, agility, and endurance remain fundamental to football success, with standardized tests enabling targeted training programs (Datson et al., 2014).

Indian women's football has shown remarkable progress in recent years. The national team has participated in prestigious tournaments, including the AFC Women's Olympic Qualifiers. A distinctive feature of Indian women's football is its substantial representation from eastern and northeastern regions, particularly Manipur, which has produced elite players like Bala Devi the first Indian woman to sign with a European club, and Ashalata Devi, an AFC

Women's Player of the Year finalist. These regions consistently contribute significant numbers of players to the national squad.

Despite progress, significant challenges persist: limited media attention, gender-based pay disparities, and inadequate infrastructure compared to men's football. However, increasing participation among young girls, emerging female role models, and expanding grassroots initiatives are gradually shifting societal attitudes (Caudwell, 2011). Growing demand for gender equality in sports and increasing government and private sector investments offer hope for a more inclusive future for women's football in India.

2. LITERATURE REVIEW

According to (Black et al., 2018) A study examining the transition of female Australian football players from amateur to semi-elite levels identified key physical attributes that distinguish selected from non-selected athletes. The research involved 22 state academy players and 27 non-selected players, assessing their performance through the Yo-Yo Intermittent Recovery Test Level 1, countermovement jump, and 30-meter sprint tests. Findings revealed that selected players displayed superior sprint performance and aerobic capacity. Additionally, selected midfielders had higher match involvement and total running distance. Strong correlations were found between sprint speed, aerobic fitness, and high-speed running during matches. The study concluded that targeted development of physical fitness is essential for effective transition and preparation for national-level competition.

According to (Farley et al., 2022) A comprehensive study was conducted to examine the physical fitness profiles of 240 female Australian football players across five competitive levels, ranging from elite seniors to non-elite juniors. Using 28 physical fitness assessments, significant differences were found across competition levels in body composition, flexibility, muscular strength and endurance, balance, reaction time, and whole-body locomotor performance. Elite senior and high-level junior players demonstrated superior strength, speed, responsiveness, and cardiorespiratory fitness compared to their non-elite counterparts. These findings highlight the physical distinctions between athletes at different stages of development and offer valuable insights for talent identification, athlete development, and injury prevention strategies in women’s Australian football.

According to (Goral, 2015) investigated agility performance among soccer players based on their playing positions using the Illinois Agility Test and the Agility T-Test. Sixty-eight male players were categorized into goalkeepers, defenders, midfielders, and strikers. Statistical analysis using one-way ANOVA and Tukey HSD revealed that midfielders demonstrated significantly faster agility than goalkeepers in both tests ($p<0.05$). The study concluded that regular assessment of agility by playing position can help tailor training to enhance performance.

According to (Asamoah & Grobbelaar, 2016) psychological skill levels vary by playing position in team sports such as volleyball, rugby, and hockey, indicating distinct mental demands for each role. However, studies in soccer show inconsistent findings. A study involving 263 student soccer players (M age = 22.64 years) assessed positional differences using the SMTQ (Sheard et al., 2009), ACSI-28 (Smith et al., 1995), and GEQ (Carron et al., 1985). Results revealed that defenders scored higher than midfielders in consistency, while midfielders showed greater control than defenders and forwards. No significant differences were found in the seven psychological coping skills. For the group integration task, forwards and goalkeepers scored higher than midfielders. These findings support the notion that positional psychological demands differ, emphasizing the need for tailored psychological skills training and cohesion strategies.

According to (Kristjánsdóttir et al., 2019) women's football has been limited in comparison to men's football. The study aimed to examine psychological differences, including psychological skills, mental toughness (MT), and anxiety, among women football players at different competitive levels (national team, first division, and second division). The research involved 142 Icelandic women football players (average age 23.5 ± 3.5 years), who completed the Test of Performance Strategies (TOPS), the Sport Mental Toughness Questionnaire (SMTQ), and the Sport Anxiety Scale-2 (SAS-2). Using one-way ANOVA and classification tree analysis, the study found minimal differences in psychological skills, but national team players demonstrated the highest mental toughness and the lowest anxiety levels. Significant differences were also observed between the first and second divisions in relaxation (TOPS), confidence (SMTQ), and worry (SAS-2). The classification tree successfully predicted the players' competitive level for 54.9% of the sample. These findings highlight the importance of incorporating sports psychologists into national and club teams for women's football players.

According to (Şimşek et al., 2023) A study aimed to assess the mental toughness levels of male and female football players using the Sports Mental Toughness Questionnaire (SMTQ). The sample included 232 Super League female and amateur male football players from Batman province during the 2021–2022 season. Data analysis through SPSS 22 involved descriptive statistics, t-tests, ANOVA, and post hoc tests. Significant differences in mental toughness were found based on age, education level, years of experience, and playing level, but not by gender. The study emphasized the importance of regular mental training to enhance psychological readiness and performance.

According to (K.-T. Williams et al., 2020) Research on the psychological preparation of women athletes, particularly football players, has been limited, despite its crucial role in enhancing performance. A study conducted on 148 women football players from the Sasol and SAFA first division leagues in Gauteng Province, South Africa, focused on assessing mental toughness using standardized tools such as the Mental Skills Inventory (MSI), Sport Mental Toughness Questionnaire (SMTQ), Sport Competition Anxiety Test (SCAT), and Rosenberg Self-Esteem Scale (RSQ). Findings revealed moderate mental toughness across participants, with 26.4% showing high anxiety and 33.8% exhibiting low self-esteem. A significant inverse relationship was found between anxiety and mental toughness (-.436), and a positive correlation between self-esteem and mental toughness (.625). The study emphasized the need for psychological skills training programs to enhance mental toughness, self-esteem, and anxiety management, thereby improving overall match performance.

According to (Allison et al., 2018) A study linking ESPN recruit rankings (2007–2016) with 2000 U.S. Census data examined the hometown socio-economic and demographic profiles of Black and white college football players and those drafted into the NFL. The findings showed that Black draftees came from more densely populated, socioeconomically disadvantaged, and predominantly Black hometowns compared to Black non-draftees. White draftees were found to come from less socioeconomically disadvantaged areas than white non-draftees. This highlights how athletes' race and draft status are associated with differing social origins in American football.

According to (Richard et al., 2023) investigated socio-economic disparities in sport participation in Geneva from 2005 to 2019 using data from the Bus Santé survey. Findings revealed that individuals with higher educational levels, incomes, and occupational positions were significantly more likely to engage in sports. Notably, the degree of inequality varied by

sport type sports like tennis and badminton showed higher socio-economic disparities compared to football. Over time, absolute inequalities in sport participation, particularly linked to household income, increased, especially among women and older adults. The study underscores the need for targeted interventions to enhance sport participation among socio-economically disadvantaged groups.

According to (Rittsteiger et al., 2021) Participation in sports and physical activity (PA) plays a vital role in the health and social development of children. A study based on the MoMo/KiGGS dataset (2009–2017) involving around 7000 German children and adolescents revealed that higher parental socioeconomic status (SES), better local infrastructure (walkability and facilities), and strong family and peer support significantly increase children's involvement in both organized and unorganized sports. However, SES has a more pronounced impact on organized sports, likely due to associated costs such as club fees and equipment. Gender differences were observed, with boys participating more than girls, while migration background showed no clear influence. The findings suggest that reducing financial barriers could enhance access to organized sports for children from lower SES backgrounds.

According to (Rajesh et al., 2021) The relationship between socio-economic status (SES) and emotional intelligence (EI) in sports performance has been explored in several studies, highlighting their influence on athletic achievement. Research has consistently shown that athletes from higher SES backgrounds often have better access to resources, training facilities, and support systems, potentially leading to better performance outcomes. Emotional intelligence, on the other hand, plays a crucial role in an athlete's ability to manage stress, maintain focus, and communicate effectively, all of which are vital for success in competitive sports. Previous studies have suggested that emotional intelligence is a stronger predictor of athletic achievement than socio-economic status, as it directly impacts an athlete’s mental resilience and performance under pressure. However, findings regarding the relationship between SES and athletic success have been mixed, with some studies indicating no significant correlation. This body of literature underscores the need for further exploration of these factors, particularly in the context of specific athletic disciplines and regions, such as the current study’s focus on women track and field athletes in Kerala, India.

According to (Kelly et al., 2024) This study investigates the influence of socioeconomic status (SES) and psychological characteristics on talent identification and development in

English academy soccer players. It explores the interaction between social factors and psychological traits, which has been under-researched. The participants, aged 11-16 years, were categorized into 'higher-potentials' and 'lower-potentials' based on coach rankings. SES was assessed through home postcodes, using the UK General Registrar Classification and CameoTM geodemographic database, while psychological characteristics were measured using the Psychological Characteristics for Developing Excellence Questionnaire (PCDEQ). The findings revealed that higher-potentials came from families with lower SES classifications and exhibited superior coping abilities in handling performance and developmental pressures. The study emphasizes the importance of considering both SES and psychological traits in the selection and development of sporting talent, suggesting the need for player-centered development and tailored support within academies.

3. STATEMENT OF THE PROBLEM

- The purpose of the study is to conduct a **"Quantitative Assessment of Physical Fitness and Psychological traits of Women Football Players belonging to different Socio-Economic Status."**

4. OBJECTIVES OF THE STUDY

The objectives of the study will be as follows: -

i. To assess the level of physical fitness(speed, agility, strength, and endurance) of different regions(Eastern and Northeastern regions) women football players belonging to different socio-economic status.

ii. To assess the level of psychological traits (mental toughness, mental skill, and athletic coping skill) of different regions(Eastern and Northeastern regions) women football players belonging to different socio-economic status.

iii. To study the influence of different socio-economic status(upper class, upper middle class, lower middle class, upper lower class, and lower class) and different

regions(Eastern and Northeastern regions) on physical fitness(speed, agility, strength, and endurance) of women football players.

iv. To study the influence of different socio-economic status(upper class, upper middle class, lower middle class, upper lower class, and lower class) and different regions(Eastern and Northeastern regions) on psychological traits (mental toughness, mental skill, and athletic coping skill) of women football players.

v. To study the interaction of different regions(Eastern and Northeastern regions) and different socio-economic status(upper class, upper middle class, lower middle class, upper lower class, and lower class) on physical fitness(speed, agility, strength, and endurance) of women football players.

vi. To study the interaction of different regions(Eastern and Northeastern regions) and different socio-economic status(upper class, upper middle class, lower middle class, upper lower class, and lower class) on psychological traits (mental toughness, mental skill, and athletic coping skill) of women football players.

5. DELIMITATIONS

The study will be carried out under some delimitations. Those are:

i. The study will be delimited to state-level women football players.
ii. The age group of the subjects will be delimited to 18-25 years of age.
iii. The study will focus on 400 women football players, consisting of 200 players each from the Eastern and Northeastern regions. These players will be divided into five distinct socio-economic classes.
iv. The study will be delimited to state-level women football players selected from the Eastern and Northeastern regions of India, including the Seven Sister states, Sikkim, West Bengal, Odisha, and Bihar.
v. The study will focus exclusively on physical fitness and psychological traits.

6. LIMITATIONS

The study will be carried out under some limitations. Those are:

i. Individual interest, motivation, attitude, and other mental factors will be limited for analyzing the participants.
ii. The environmental conditions on different test days will not be exactly similar. The researcher's control over changing environmental conditions is beyond question.
iii. Food habits and personal lifestyle will be the limiting factors for the study.
iv. Participants may be unable to block out sounds, sights, or odors that interfere with their ability to focus on tasks, and they may also have a limited ability to tolerate noise and crowds.
v. Participants may experience restlessness, a shortened attention span, distraction, and difficulty understanding or remembering verbal directions, which could affect the reliability of the data collected.

7. HYPOTHESIS

It is hypothesized that:

i. **H_0^1**: There will be no significant influence of different regions(Eastern and Northeastern regions) and different socio-economic status on the physical fitness and psychological traits of women football players.
ii. **H_0^2**: There will be no significant interaction between different regions(Eastern and Northeastern regions) and different socio-economic status on the physical fitness and psychological variables of women football players.

8. DEFINITION AND EXPLANATION OF TERMS

SOCIO-ECONOMIC STATUS:

Socio-economic status is the social standing or class of an individual or group. It is often measured as a combination of social environment, education, income, and occupation (American Psychological Association).

PHYSICAL FITNESS:

Physical fitness refers to the ability of your body systems to work together efficiently to allow you to be healthy and perform activities of daily living. When it is related to sports, it is the application of all components (speed, agility, balance, power, coordination, etc.) in sports and helps to perform well, which requires motor skills (Caspersen et al., 1985).

SPEED:

Speed is essential for successful performance in many motor activities. In general, speed is the capability of the individual to perform successive movements of the same pattern at a fast rate (Barrow & McGee, 1979).

AGILITY:

Agility is the ability to change the body's position efficiently and requires the integration of isolated movement skills using a combination of balance, coordination, speed, reflexes, strength, and endurance.

STRENGTH:

Strength refers to the ability of muscles to exert force against resistance. It is essential for tasks requiring muscular endurance and power. Strength training improves muscle strength, which can enhance performance in sports and daily activities requiring physical exertion (Suchomel et al., 2016).

ENDURANCE:

Endurance is the ability of the body to sustain prolonged physical activity and resist fatigue over time. It involves cardiovascular fitness and muscular endurance, allowing individuals to maintain effort and performance during extended periods of exercise or activity (Bassett & Howley, 2000).

FOOTBALL:

Football typically refers to the sport known as soccer in some countries, where two teams of eleven players each compete to score goals by getting a ball into the opposing team's goal. It is played primarily with the feet, though players can also use their heads and bodies to control and pass the ball (Stølen et al., 2005).

MENTAL TOUGHNESS:

Mental Toughness refers to the resilience and strength of mind that enable individuals to persevere through challenges, maintain focus, and stay motivated despite adversity. It encompasses a set of psychological attributes that contribute to a person's ability to cope with stress, pressure, and difficult situations effectively (Gucciardi et al., 2015).

MENTAL SKILLS :

A mental skill is a cognitive or emotional ability that athletes develop and use to enhance their performance and manage the psychological demands of their sport (Tenenbaum & Eklund, 2007).

IMAGERY ABILITY:

Imagery ability refers to the capacity to generate and manipulate mental images, a cognitive process that involves visualizing physical actions and scenarios without actual physical movement (Gregg et al., 2010).

MENTAL PREPARATION:

Mental preparation encompasses psychological strategies used to ready an athlete's mind for performance, including goal setting, mental rehearsal, and pre-performance routines.

SELF CONFIDENCE:

Self-confidence refers to the belief in one's ability to succeed in specific situations or accomplish a task. In sports psychology, self-confidence is crucial as it influences an athlete's motivation, persistence, and performance outcomes.

ANXIETY AND WORRY MANAGEMENT:

Anxiety and Worry Management refers to the strategies and techniques used to control and reduce feelings of anxiety and excessive worry.

CONCENTRATION ABILITY:

Concentration ability refers to the capacity of an individual to focus their attention and mental resources on a particular task, activity, or information.

RELAXATION ABILITY:

Relaxation ability refers to an individual's capacity to effectively reduce stress and tension, both physically and mentally.

MOTIVATION:

Motivation refers to the internal and external factors that drive an individual to pursue and achieve goals.

ATHLETIC COPING SKILLS:

Athletic Coping Skills refer to the strategies and techniques that athletes use to effectively manage the psychological demands of training, competition, and overall athletic participation. These skills help athletes maintain focus, manage stress, and enhance their performance by promoting mental resilience and emotional stability.

COPING WITH ADVERSITY:

Coping with Adversity refers to the methods and strategies individuals use to manage and overcome challenging situations. Adversity can take many forms, including personal loss, financial hardship, health issues, or social difficulties.

COACHABILITY:

Coachability is the willingness and ability of an athlete to learn from coaches, accept constructive criticism, and make adjustments based on feedback to improve performance.

CONCENTRATION:

Concentration is the ability to focus one's attention on the task at hand while ignoring distractions.

CONFIDENCE AND ACHIEVEMENT MOTIVATION:

Confidence refers to the belief in one's abilities to succeed, while achievement motivation is the drive to meet and exceed goals.

GOAL SETTING AND MENTAL PREPARATION:

Goal setting involves identifying specific, measurable, achievable, relevant, and time-bound (SMART) objectives. Mental preparation encompasses the psychological techniques used to ready the mind for competition.

PEAKING UNDER PRESSURE:

Peaking under pressure is the ability to perform at one's best during high-stress situations or important events.

FREEDOM FROM WORRY:

Freedom from worry is the ability to maintain a calm and relaxed state of mind, free from excessive anxiety and negative thoughts.

9. METHODOLOGY

9. 1 SELECTION OF PARTICIPANTS

Four hundred women football players (200 from each of the Eastern and Northeastern regions) will be surveyed using the Kuppuswamy questionnaire via Google Forms. Players will be categorized into five socio-economic classes, with 20 randomly selected from each class in both regions.

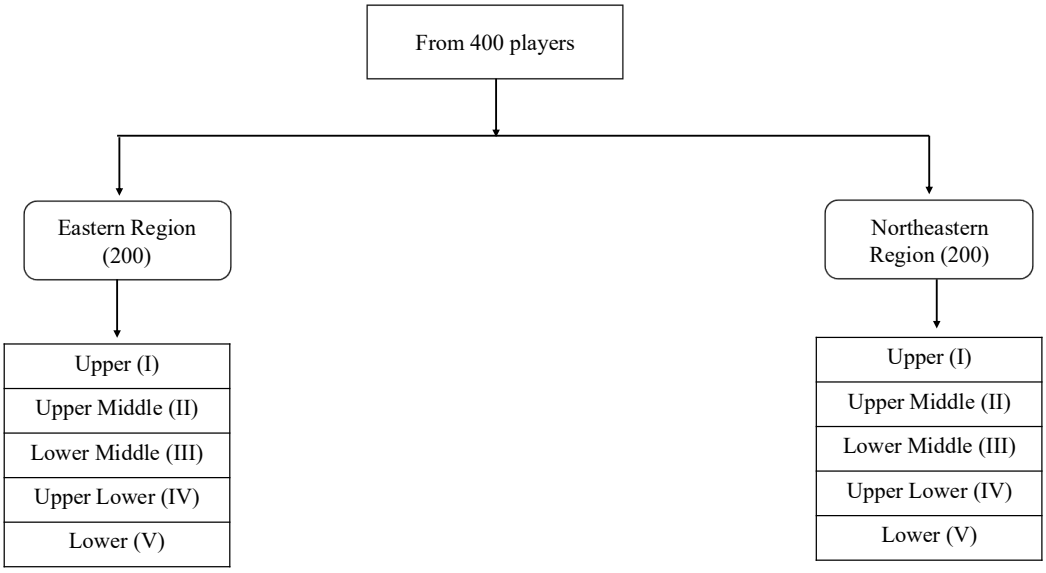

Figure 1: illustrates the design of the selection of the sample

9.2 SELECTION OF VARIABLES

- Independent Variable: Socio-economic status (SES), categorized into five classes: Upper class, Upper middle class, Lower middle class, Upper lower class, Lower class.
- Dependent Variables:
    - Physical traits: Speed, Agility, Strength, Endurance
    - Psychological traits: SMTQ, Mental Skills Questionnaire, ACSI-28

9.3 SAMPLING TECHNIQUE

Stratified random sampling will be used, ensuring representation across socio-economic groups.

9.4 CRITERION MEASURES

Parameters (Personal data)	**Measurement tool/technique**	**Units**
Age	Calculated from date of birth	years
Weight	Weighing machine	kg
Height	Anthropometric rod or stadiometer	cm
Physical fitness	**Test for assessment**	**Units**
Speed	50-meter sprint	seconds
Agility	(4*10 meter) Shuttle run	seconds
Strength	Sit-ups	No. of sit-ups in one minute
Endurance	Cooper's 12-minute run test	Distance covered(meters)
Psychological Traits	1. Sports Mental Toughness Questionnaire (SMTQ) 2. Mental Skills Questionnaire 3. Athletic Coping Skills Inventory-28 (ACSI-28)	
Socio-economic status	Kuppuswamy Scale Test(2023)	

Figure 2

9.5 COLLECTION OF DATA

Data collection will involve selecting participants based on socio-economic status and using standardized tests for physical fitness (speed, agility, strength, and endurance) and validated questionnaires for psychological traits (mental toughness, mental skills, and athletic coping skills).

9.6 STATISTICAL TECHNIQUE

Descriptive statistics will characterize the data, and a Two-Way ANOVA will be used to analyze the effects of region and socio-economic status on physical fitness and psychological

traits. Interaction effects will also be explored. The significance level will be set at 0.05, and SPSS software will be used. Post hoc tests will be applied for significant differences.

10. EXPECTED OUTCOME

The expected outcome of the study is to uncover substantial differences in physical fitness and psychological characteristics among women football players of different socio-economic statuses and regions (Eastern and Northeastern India). It is expected that players from more socio-economically privileged backgrounds will have superior physical qualities and psychological abilities as a result of enhanced access to training, nutrition, and support systems, whereas players from less socio-economically privileged backgrounds will be able to show greater resilience and coping capacities despite fewer resources. The research is aimed at bringing out the region's socio-economic status interaction effects and thus presenting empirical evidence to support informed policy-making, resource development, and athlete development approaches for Indian women's football.

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